

Assessment of right ventricular function using Navigator®

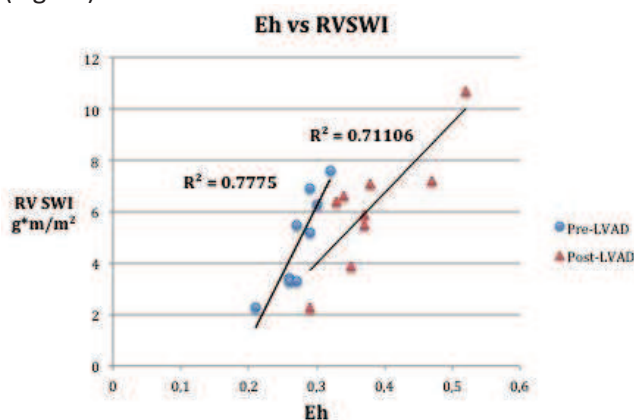
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Background and Goal of Study: Right ventricular failure (RVF) complicates 30% of left ventricular assist device (LVAD) implantation cases and contributes to increased postoperative morbidity and mortality. Right ventricular Stroke Work Index (RV SWI) has been used to predict and to evaluate right ventricular dysfunction in LVAD patients, but it needs to be calculated. The Navigator software (Applied Physiology, Sydney, Australia) provides a continuous peri-operative estimation for heart performance Eh.

The aim of this study was to evaluate whether Eh can be used to evaluate right ventricular performance in LVAD patients.

Materials and Methods: After ethical approval and informed consent 10 LVAD patients were included. In addition to standard ASA monitoring, a PAC was introduced for the measurement of cardiac output (CO) and calculation of RVSWI. Navigator was used to determine mean systemic filling pressure (Pms) and heart performance (Eh). Pms estimation is based on the equation : $Pms = 0.96(CVP) + 0.04(MAP) + c(CO)$ where c has the dimensions of resistance and is a function of the patient's height, weight and age. Global cardiac pumping efficiency Eh was calculated as $Eh = (Pms - CVP) / Pms$. RV SWI and Eh data were collected after induction of anaesthesia (pre-LVAD) and at the end of surgery (post-LVAD). Pearson correlation test was calculated to assess the relation between RV SWI and Eh. A Bland-Altman analysis was not considered valid because both parameters are measured in different units. **Results and Discussion:** RV SWI increased from 4.91 ± 1.77 to $6.18 \pm 2.19 \text{ g}\cdot\text{m}/\text{m}^2$ after LVAD implantation, while Eh increased from 0.27 ± 0.03 to 0.38 ± 0.07 . Correlation between both parameters was 0.89 before and 0.84 after implantation (Figure).



[Correlation between Eh and RV SWI]

Conclusion(s): Navigator can be used for the continuous evaluation of RV function in LVAD patients.

Reference:

1. Parkin and Leaning. Therapeutic control of the circulation. J Clin Monit Comput (2008) vol. 22 (6) pp. 391-400